

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	)	
	)	
<b>François LE BOURHIS et al.</b>	)	Group Art Unit: 1616
	)	
Application No.: 10/796,016	)	Examiner: SOROUSH, Ali
	)	
Filed: March 10, 2004	)	Confirmation No.: 2658
	)	
For: AEROSOL DEVICE COMPRISING	)	
A COSMETIC COMPOSITION	)	
COMPRISING AT LEAST ONE	)	<b><u>VIA EFS-WEB</u></b>
POLYURETHANE AND AT LEAST	)	
ONE PROPELLANT	)	
COMPRISING DIMETHYL ETHER	)	
AND AT LEAST ONE C <sub>3</sub> -C <sub>5</sub>	)	
HYDROCARBON	)	

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

**SUBMISSION OF CERTIFIED ENGLISH LANGUAGE  
TRANSLATION OF FOREIGN PRIORITY DOCUMENT**

Applicants hereby submit an English language translation of French Patent Application No. 03/03,000 and a statement of accuracy signed by the translator. Applicants claimed foreign priority to French Patent Application No. 03/03,000 in the application transmittal letter filed on March 10, 2004. In addition, Applicants submitted a certified copy of the foreign priority application on March 10, 2004. By this submission, Applicants perfect their claim to foreign priority under 35 U.S.C. § 119 to French Patent Application No. 03/03,000.

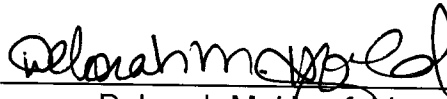
If there is any fee necessary for this submission, please charge our Deposit  
Account No. 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,  
GARRETT & DUNNER, L.L.P.

Dated: July 20, 2010

By:

A handwritten signature in black ink, appearing to read "Deborah M. Herzfeld", written over a horizontal line.

Deborah M. Herzfeld  
Reg. No. 52,211

**DECLARATION**

I, Philippe PEPERMANS

of BUREAU D.A. CASALONGA-JOSSE, 8 Avenue Percier, 75008 PARIS,  
FRANCE

do solemnly and sincerely declare that I am conversant with the English and French  
languages and I am a competent translator thereof,  
and that the following is, to the best of my knowledge and belief,  
a true and correct translation of the specification and claims of French Patent  
Application No. 0303000 filed on March 11, 2003.

Dated : July 19, 2010

  
Philippe PEPERMANS

B03/0140FR

OA 03 076

Société Anonyme known as: L'OREAL

Aerosol device containing a cosmetic composition  
comprising a polyurethane and a propellant comprising  
dimethyl ether and at least one hydrocarbon

Inventors:

Aerosol device containing a cosmetic composition comprising a polyurethane and a propellant comprising dimethyl ether and at least one hydrocarbon

5 The present invention relates to an aerosol device containing a cosmetic composition comprising, in a cosmetically acceptable medium containing water and at least one organic solvent, at least one polyurethane, and a propellant comprising dimethyl ether and at least  
10 one hydrocarbon. The invention is also directed towards a process for shaping or holding the hairstyle in which these devices are used, and also towards the use of these devices to apply a lacquer.

15 The cosmetic compositions for shaping and/or holding the hairstyle that are the most widely available on the cosmetics market are spray compositions consisting essentially of a solution, usually an alcoholic solution, and of one or more components, generally  
20 polymer resins, the function of which is to form welds between the hairs, these resins being known as fixing components, as a mixture with various cosmetic adjuvants. This solution is generally packaged either in a suitable aerosol container pressurized using a  
25 propellant, or in a pump-dispenser bottle.

Numerous aerosol systems for fixing the hair are known, these systems containing a liquid phase (or fluid) on the one hand, and a propellant on the other hand. The  
30 function of this propellant is to provide a pressure to allow the liquid phase to be sprayed and to be applied to the hair in the form of a cloud of dispersed droplets.

35 Certain non-aqueous formulations are characterized by the generation of a spray that is termed "gentle". This term covers a set of sensory characteristics associated, inter alia, with the force of the spray and a reduced acoustic signature. These characteristics are

usually obtained in various ways applied individually or otherwise, such as reduced pressure of the formulation or a slow flow rate thereof.

5 Out of concern to reduce to a value of 80% v/v the amount of volatile organic compounds (VOCs) such as alcohols and fluorohydrocarbons present in spray compositions of this type, from 15% to 20% v/v of water is usually introduced into the formulations. For  
10 reasons of solubility of the medium, this presence of water in the formulation entails the use of dimethyl ether as a propellant, which has the consequence of increasing the internal pressure, the flow rate, the force of the spray and the noise, the consequence of  
15 which is to obtain a spray that can no longer be termed "gentle".

The problem of obtaining formulations characterized by the generation of a gentle spray containing dimethyl  
20 ether as propellant gas thus arises. The solutions used to obtain a gentle spray with this type of formulation, which consist, for example, in reducing the flow rate, do not give a fully satisfactory result. The expected working qualities become degraded: for example, the  
25 level of fixing obtained becomes significantly too weak. The introduction of hydrocarbons in combination with dimethyl ether in a formulation containing standard fixing polymers does not solve this problem either.

30 Aerosol devices using dimethyl ether as propellant and containing as fixing polymer a polycondensate comprising at least one polyurethane and/or polyurea unit have been described in patent application FR-A-2  
35 782 635. However, these formulations do not allow a gentle spray to be generated.

Similarly, patent application US 5 626 840 describes a hair-fixing composition comprising a linear

carboxylated polyurethane, a base, a solvent and also dimethyl ether or a hydrocarbon as propellant. Similarly, this type of formulation does not allow a spray that can be termed gentle to be generated.

5

The Applicant has found, surprisingly and advantageously, that the use, in a medium containing water and at least one organic solvent, of a polyurethane with a mixture of dimethyl ether and one  
10 or more hydrocarbons as propellant allows the production of a gentle spray while at the same time maintaining a good level of fixing and good cosmetic properties such as softness or disentangling.

15 One subject of the present invention is thus an aerosol device containing a cosmetic composition comprising a polyurethane and a mixture of propellant gases comprising dimethyl ether and at least one hydrocarbon.

20 Another subject of the invention concerns a process for shaping or holding the hairstyle, comprising the use of this aerosol device.

Another subject of the invention consists of the use of  
25 the said device to apply a lacquer to the hair.

Other subjects, characteristics, aspects and advantages of the invention will emerge even more clearly on reading the description and the various examples that  
30 follow.

The present invention concerns an aerosol device containing:

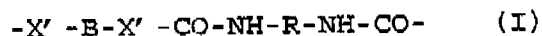
35 A. a cosmetic composition comprising, in a cosmetically acceptable medium containing water and at least one organic solvent, at least one polyurethane,

B. a propellant comprising dimethyl ether and at least one C<sub>3</sub>-C<sub>5</sub> hydrocarbon.

5 The C<sub>3</sub>-C<sub>5</sub> hydrocarbons according to the invention are preferably chosen from n-butane, isobutane and propane, or a mixture of these hydrocarbons. n-Butane will preferably be used.

10 The polyurethanes of the invention are fixing polyurethanes. The term "fixing polyurethane" means a polyurethane whose function is to impart or maintain a given shape to the hairstyle.

15 The polyurethanes preferably used according to the invention contain a base repeating unit corresponding to the general formula (I) below:



20 in which

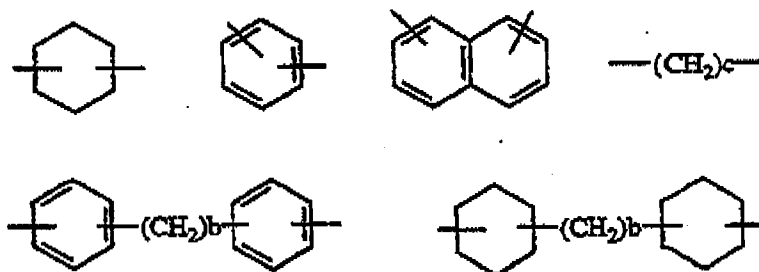
- X' represents O and/or NH,
- B is a divalent hydrocarbon-based radical, this radical being substituted or unsubstituted, and
- R is a divalent radical chosen from branched or  
25 unbranched alkylene radicals of C<sub>6</sub>-C<sub>20</sub> aromatic, C<sub>1</sub>-C<sub>20</sub> and preferably C<sub>1</sub>-C<sub>6</sub> aliphatic and C<sub>1</sub>-C<sub>20</sub> and preferably C<sub>1</sub>-C<sub>6</sub> cycloaliphatic type, these radicals being unsubstituted or substituted with one or more halogen, C<sub>1</sub>-C<sub>4</sub> alkoxy or C<sub>6</sub>-C<sub>30</sub> aryl, in particular phenyl,  
30 groups.

Preferably, the radical B is a C<sub>1</sub>-C<sub>30</sub> and preferably C<sub>2</sub>-C<sub>10</sub> divalent radical and bears a group containing one or more carboxylic functions and/or one or more  
35 sulphonic functions, the said carboxylic and/or sulphonic functions being in free form or partially or totally neutralized with a mineral or organic base such as alkali metal or alkaline-earth metal hydroxides, aqueous ammonia, alkylamines, alkanolamines or organic



amino acids. B is preferably the divalent radical derived from dimethylolpropionic acid.

The radical R is advantageously chosen from the radicals corresponding to the following formulae:

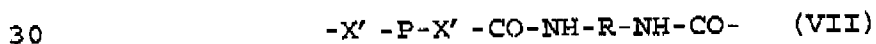


in which b is an integer between 0 and 3 and c is an integer between 1 and 20 and preferably between 2 and 12.

In particular, the radical R is chosen from hexamethylene, 4,4'-biphenylenemethane, 2,4- and/or 2,6-tolyene, 1,5-naphthylene, p-phenylene and methylene-4,4-bis-cyclohexyl radicals and the divalent radical derived from isophorone.

According to the present invention, the fixing polyurethanes may comprise silicone grafts and silicones containing hydrocarbon-based grafts. These various compounds may be nonionic, cationic or amphoteric.

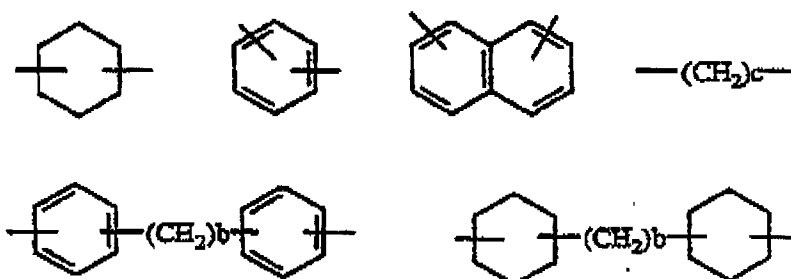
A polyurethane used in the present invention may also advantageously comprise at least one polysiloxane block, and its base repeating unit corresponds, for example, to the general formula (VII):



in which:

- P is a polysiloxane segment,

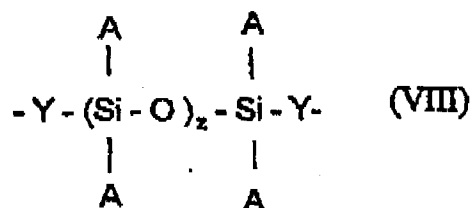
- X' represents O and/or NH, and
  - R is a divalent radical chosen from branched or unbranched alkylene radicals of C<sub>6</sub>-C<sub>20</sub> aromatic, C<sub>1</sub>-C<sub>20</sub> and preferably C<sub>1</sub>-C<sub>6</sub> aliphatic and C<sub>1</sub>-C<sub>20</sub> and preferably C<sub>1</sub>-C<sub>6</sub> cycloaliphatic type, these radicals being unsubstituted or substituted with one or more halogen, C<sub>1</sub>-C<sub>4</sub> alkoxy and C<sub>6</sub>-C<sub>30</sub> aryl, in particular phenyl, groups.
- 10 The radical R is advantageously chosen from the radicals corresponding to the following formulae:



- 15 in which b is an integer between 0 and 3 and c is an integer between 1 and 20 and preferably between 2 and 12.

In particular, the radical R is chosen from  
 20 hexamethylene, 4,4'-biphenylenemethane, 2,4- and/or 2,6-tolylene, 1,5-naphthylene, p-phenylene and methylene-4,4-bis-cyclohexyl radicals and the divalent radical derived from isophorone.

- 25 Advantageously, the polysiloxane segment P corresponds to the general formula (VIII) below:



- 30 in which:

- the groups A, which may be identical or different, are chosen firstly from C<sub>1</sub>-C<sub>20</sub> monovalent hydrocarbon-based groups substantially free of ethylenic unsaturation and, secondly, aromatic groups,

- 5 - Y represents a divalent hydrocarbon-based group, and  
- z represents an integer chosen such that the average molecular mass of the polysiloxane segment is between 300 and 10,000.

- 10 In general, the divalent group Y is chosen from the alkylene groups of formula  $-(CH_2)_a-$ , in which a represents an integer that may be between 1 and 10.

- The groups A may be chosen from C<sub>1</sub>-C<sub>18</sub> alkyl groups, in particular methyl, ethyl, propyl, isopropyl, butyl, 15 pentyl, hexyl, octyl, decyl, dodecyl and octadecyl groups; cycloalkyl groups, in particular the cyclohexyl group; aryl groups, especially phenyl and naphthyl; arylalkyl groups, especially benzyl and phenylethyl, 20 and also tolyl and xylyl groups.

The polyurethane of the invention is preferably anionic.

- 25 Examples of fixing polyurethanes that may especially be mentioned include the dimethylolpropionic acid/isophorone diisocyanate/neopentyl glycol/polyesterdiols copolymer (also known under the name polyurethane-1, INCI name) sold under the brand name Luviset® PUR by 30 the company BASF, and the dimethylolpropionic acid/isophorone diisocyanate/neopentyl glycol/polyesterdiols/silicone diamine copolymer (also known under the name polyurethane-6, INCI name) sold under the brand name Luviset® Si PUR A by the company BASF.

35

Preferably, the polymer used is one sold under the name Luviset SI-PUR ZK 553-24 by the company BASF.

The cosmetic composition according to the invention preferably comprises the polyurethane(s) in an amount of between 0.5% and 20% by weight and preferably between 2% and 12% by weight relative to the total weight of all of the compositions contained in the aerosol device.

Preferably, the propellant represents 20% to 70% by weight relative to the total weight of all of the compositions contained in the aerosol device.

The propellant contains from 1% to 30% and preferably from 5% to 20% by weight of hydrocarbon relative to the total weight of all of the compositions contained in the aerosol device.

The propellant contains from 5% to 70% and preferably from 10% to 50% by weight of dimethyl ether relative to the total weight of all of the compositions contained in the aerosol device.

The expression "all of the compositions contained in the aerosol device" means, for the purposes of the present invention, the cosmetic composition A and the propellant B.

The cosmetically acceptable medium is a medium containing water and at least one organic solvent.

For the purposes of the present invention, the term "organic solvent" means an organic compound that is liquid at a temperature of 25°C and at atmospheric pressure. The organic compound is preferably polar.

The solvent is preferably an alcohol. This alcohol is chosen especially from C<sub>1</sub>-C<sub>4</sub> lower alcohols, for instance ethanol, isopropanol, tert-butanol or n-butanol; polyols, for instance propylene glycol,

polyol ethers, and mixtures thereof, ethanol being the alcohol that is particularly preferred.

5 In the cosmetically acceptable medium, the proportion of water may be between 0.5% and 35% by weight relative to the total weight of all of the compositions contained in the aerosol device. The organic solvent proportion of the mixture is between 1% and 70% by weight, preferably between 15% and 65% by weight and  
10 even more preferably between 30% and 60% by weight, relative to the total weight of all of the compositions contained in the aerosol device.

The fixing cosmetic composition according to the  
15 invention may also contain at least one adjuvant chosen from the other non-polyurethane fixing polymers, for instance silicones in soluble, dispersed or microdispersed form, nonionic, anionic, cationic and amphoteric surfactants, ceramides and pseudoceramides,  
20 vitamins and provitamins including panthenol, plant, animal, mineral and synthetic oils, waxes other than ceramides and pseudoceramides, water-soluble and liposoluble, silicone or non-silicone sunscreens, glycerol, mineral and organic, coloured or uncoloured  
25 pigments, permanent or temporary dyes, nacreous agents and opacifiers, sequestering agents, plasticizers, solubilizing agents, acidifying agents, basifying agents, mineral and organic thickeners, antioxidants, hydroxy acids, penetration agents, fragrances,  
30 fragrance solubilizers (peptizers), preserving agents, anticorrosion agents and treatment agents.

A person skilled in the art will take care to select the optional additives and the amount thereof such that  
35 they do not harm the properties of the compositions of the present invention.

These additives are present in the cosmetic composition according to the invention in an amount ranging from 0

to 20% by weight relative to the total weight of the cosmetic composition.

5 The compositions in accordance with the invention are used as compositions for shaping and/or holding the hair.

10 The invention also relates to the use of the composition vaporized by the aerosol device according to the invention, as a hair lacquer.

The present invention also relates to a hair care process for shaping or holding the hairstyle, comprising the use of the device described above.

15

Another subject of the invention concerns the use of the device to apply a lacquer to the hair by vaporizing its contents.

20 The examples that follow illustrate the present invention and should not be considered as limiting the invention in any way.

Example 1:

25

The Applicant prepared a device in accordance with the invention, comprising formulation 1 below:

Luviset SI-PUR ZK 553-24 resin (from BASF) (expressed as weight of polymer)	6.00
Parsol MCX (ethylhexyl methoxycinnamate) (from Roche Vitamins)	0.05
Demineralized water (contained in the polymer in its commercial form)	12
Demineralized water for formulation	3
Fragrance	0.10
n-Butane	15
Dimethyl ether	25
Absolute ethyl alcohol qs	100

Example 2:

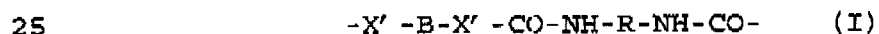
The Applicant prepared a device in accordance with the  
5 invention, comprising formulation 2:

Luviset SI-PUR ZK 553-22 resin (from BASF) (expressed as weight of polymer)	6.00
Parsol MCX (ethylhexyl methoxycinnamate) (from Roche Vitamins)	0.05
Demineralized water (contained in the polymer in its commercial form)	12
Demineralized water for formulation	3
Fragrance	0.10
n-Butane	15
Dimethyl ether	25
Absolute ethyl alcohol qs	100

Formulations 1 and 2 packaged in an aerosol device and  
sprayed onto hair make it possible to obtain a spray  
10 termed "gentle" and give the hair very good hold.

CLAIMS

1. Aerosol device containing:
  - 5 A. a cosmetic composition comprising, in a cosmetically acceptable medium containing water and at least one organic solvent, at least one polyurethane, and
  - 10 B. a propellant comprising dimethyl ether and at least one C<sub>3</sub>-C<sub>5</sub> hydrocarbon.
2. Device according to Claim 1, characterized in that the hydrocarbon(s) is (are) chosen from n-butane, isobutane and propane, or a mixture of these  
15 hydrocarbons.
3. Device according to Claim 2, characterized in that the hydrocarbon is n-butane.
- 20 4. Device according to any one of Claims 1 to 3, characterized in that the polyurethane according to the invention contains a base repeating unit corresponding to the general formula (I) below:

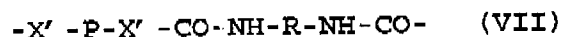


in which

- X' represents O and/or NH,
- B is a divalent hydrocarbon-based radical, this  
30 radical being substituted or unsubstituted, and
- R is a divalent radical chosen from branched or unbranched alkylene radicals of C<sub>6</sub>-C<sub>20</sub> aromatic, C<sub>1</sub>-C<sub>20</sub> and preferably C<sub>1</sub>-C<sub>6</sub> aliphatic and C<sub>1</sub>-C<sub>20</sub> and preferably C<sub>1</sub>-C<sub>6</sub> cycloaliphatic type, these  
35 radicals being unsubstituted or substituted with one or more halogen, C<sub>1</sub>-C<sub>4</sub> alkoxy or C<sub>6</sub>-C<sub>30</sub> aryl, preferably phenyl, groups.



5. Device according to Claim 4, characterized in that the radical B is a divalent C<sub>1</sub>-C<sub>30</sub> hydrocarbon-based radical.
- 5 6. Device according to Claim 4 or 5, characterized in that the radical R is chosen from the group comprising hexamethylene, 4,4'-biphenylenemethane, 2,4- and/or 2,6-tolylene, 1,5-naphthylene, p-phenylene and methylene-4,4-bis-cyclohexyl radicals and the divalent radical derived from isophorone.
- 10 7. Device according to any one of Claims 1 to 6, characterized in that the polyurethane comprises at least one base repeating unit corresponding, for example, to the general formula (VII):
- 15



20 in which:

- P is a polysiloxane segment,
  - X' represents O and/or NH, and
  - R is a divalent radical chosen from branched or unbranched alkylene radicals of C<sub>6</sub>-C<sub>20</sub> aromatic, C<sub>1</sub>-C<sub>20</sub> and preferably C<sub>1</sub>-C<sub>6</sub> aliphatic and C<sub>1</sub>-C<sub>20</sub> and preferably C<sub>1</sub>-C<sub>6</sub> cycloaliphatic type, these radicals being unsubstituted or substituted with one or more halogen, C<sub>1</sub>-C<sub>4</sub> alkoxy and C<sub>6</sub>-C<sub>30</sub> aryl groups.
- 25

30

8. Device according to any one of Claims 1 to 7, characterized in that the polyurethane is anionic.
9. Device according to any one of the preceding claims, characterized in that the cosmetic composition contains from 0.5% to 20% and preferably from 2% to 12% of polyurethane relative to the total weight of all of the compositions contained in the aerosol device.
- 35

- 5 10. Device according to any one of the preceding claims, characterized in that the propellant represents from 20% to 70% by weight relative to the total weight of all of the compositions contained in the aerosol device.
- 10 11. Device according to any one of the preceding claims, characterized in that the propellant contains from 1% to 30% and preferably from 5% to 20% of hydrocarbons relative to the total weight of all of the compositions contained in the aerosol device.
- 15 12. Device according to any one of the preceding claims, characterized in that the propellant contains from 5% to 70% and preferably from 10% to 50% of dimethyl ether relative to the total weight of all of the compositions contained in the aerosol device.
- 20 13. Device according to any one of the preceding claims, characterized in that the organic solvent is an alcohol.
- 25 14. Device according to Claim 13, characterized in that the alcohol is chosen from C<sub>1</sub>-C<sub>4</sub> alcohols, polyols and polyol ethers, and mixtures thereof.
- 30 15. Device according to Claim 14, characterized in that the alcohol is ethanol.
- 35 16. Device according to any one of the preceding claims, characterized in that the cosmetic composition contains from 0.5% to 35% water by weight relative to the total weight of all of the compositions contained in the aerosol device.

17. Device according to any one of the preceding claims, characterized in that the cosmetic composition contains from 1% to 70% by weight of C<sub>1</sub>-C<sub>4</sub> alcohol, preferably from 15% to 65% and even more preferably from 30% to 60% by weight, relative to the total weight of all of the compositions contained in the aerosol device.
18. Device according to any one of the preceding claims, characterized in that the styling composition comprises an adjuvant chosen from the other non-polyurethane fixing polymers, silicones in soluble, dispersed or microdispersed form, nonionic, anionic, cationic and amphoteric surfactants, ceramides and pseudoceramides, vitamins and provitamins including panthenol, plant, animal, mineral and synthetic oils, waxes other than ceramides and pseudoceramides, water-soluble and liposoluble, silicone or non-silicone sunscreens, glycerol, mineral and organic, coloured or uncoloured pigments, permanent or temporary dyes, nacreous agents and opacifiers, sequestering agents, plasticizers, solubilizing agents, acidifying agents, basifying agents, mineral and organic thickeners, antioxidants, hydroxy acids, penetration agents, fragrances, fragrance solubilizers, preserving agents, anticorrosion agents and treatment agents.
19. Cosmetic treatment process for shaping or holding the hairstyle, characterized in that it comprises the use of a device in accordance with any one of Claims 1 to 18.
20. Use of the product vaporized by the aerosol device according to any one of Claims 1 to 18, as a hair lacquer.

21. Use of the device according to any one of Claims 1 to 18, to apply a lacquer to the hair by vaporizing its contents.

# ABSTRACT

Aerosol device containing a cosmetic composition comprising a polyurethane and a propellant comprising dimethyl ether and at least one hydrocarbon

The invention relates to an aerosol device containing:

- A. a cosmetic composition comprising, in a cosmetically acceptable medium containing water and at least one organic solvent, at least one polyurethane, and
- B. a propellant comprising dimethyl ether and at least one C<sub>3</sub>-C<sub>5</sub> hydrocarbon.

The invention is also directed towards a process for shaping or holding the hairstyle in which these devices are used, and also towards the use of these devices to apply a lacquer.